

CLAIM AMENDMENTS

Please amend Claims 38, 40, and add Claims 59-67 as follows:

1.-37. (Cancelled)

38. (Currently Amended) A printing head which outputs temperature information in accordance with input of print data, comprising:

a shift register which inputs print data in accordance with a first-frequency clock signal;

a heater which is energized and generates heat in accordance with said print data;

a temperature detector which detects an internal temperature of said printing head; and

a ~~frequency divider~~ converter circuit ~~which divides outputs a second-frequency clock signal by converting~~ a frequency of said first-frequency clock signal ~~and generates a second-frequency clock,~~

wherein said temperature detector outputs a signal indicative of a detected temperature in accordance with said second-frequency clock signal.

39. (Original) The printing head according to claim 38, wherein said temperature detector has:

a temperature sensor;

a reference voltage generator which generates a reference voltage;

a switching circuit which changes said reference voltage in accordance with said second-frequency clock; and

a comparator which compares an output voltage from said temperature sensor with said reference voltage from said switching circuit, and outputs the result of comparison as a signal indicative of said detected temperature.

40. (Currently Amended) The printing head according to claim 38, wherein ~~said frequency divider divides the frequency of said second-frequency clock signal~~ is half of the frequency of said first-frequency clock by two signal.

41. (Original) The printing head according to claim 38, further comprising a latch circuit which latches print data stored in said shift register.

42. (Original) The printing head according to claim 38, wherein said printing head is an ink-jet printing head which performs printing by discharging ink.

43. (Original) The printing head according to claim 42, wherein said ink-jet printing head discharges ink by utilizing thermal energy, and includes a thermal energy transducer for generating the thermal energy to be applied to the ink.

44. (Original) A printing apparatus using the printing head in claim 38.

45. (Original) A head cartridge comprising:

the printing head in claim 38; and

an ink tank which contains ink to be supplied to said printing head.

46.-58. (Cancelled)

59. (New) A substrate used for printing in accordance with print data, comprising:

a shift register which inputs said print data in accordance with a first-frequency clock signal;

a printing element which performs printing in accordance with said print data; and

a frequency converter circuit which outputs a second-frequency clock signal by converting a frequency of said first-frequency clock signal.

60. (New) The substrate according to claim 59, further comprising an output circuit which outputs information on said substrate to the outside of said substrate in accordance with said second-frequency clock signal.

61. (New) The substrate according to claim 59, wherein the frequency of said second-frequency clock signal is lower than the frequency of said first-frequency clock signal.

62. (New) The substrate according to claim 59, wherein said shift register, said printing element and said frequency converter circuit are formed on the same substrate by using a semiconductor manufacturing process.

63. (New) The substrate according to claim 59, wherein said printing element performs printing by discharging ink.

64. (New) A printing head which performs printing in accordance with print data, comprising:

a shift register which inputs said print data in accordance with a first-frequency clock signal;

a printing element which performs printing in accordance with said print data; and

a frequency converter circuit which outputs a second-frequency clock signal by converting a frequency of said first-frequency clock signal, wherein said second-frequency signal is indicative of a parameter of said printing.

65. (New) The printing head according to claim 63, further comprising an output circuit which outputs information on said printing head to the outside of said printing head in accordance with said second-frequency clock signal.

66. (New) A head cartridge comprising:
the printing head in claim 64; and

an ink tank which contains ink to be supplied to said printing head.

67. (New) The head cartridge according to claim 66, wherein said printing head further comprises an output circuit which outputs information on said printing head to the outside of said printing head in accordance with said second-frequency clock signal.